

## ABSTRACT

Featured is a system to determine the three-dimensional position and orientation of an effector (a needle, probe, or other medical instrument) relative to a subject using cross-sectional images (e.g. from a CT or MRI scanner). Also provided is a method for image guided effector placement that requires no immobilization of the patient or fiducial implantation. A localization module (fiducial object) is integrated or associated with the effector allowing for the localization of the effector in the image space using a single cross-sectional image.

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